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09/644,476	08/23/2000	David J. Corisis	108298531US	2634

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EXAMINER

GRAYBILL, DAVID E

ART UNIT

PAPER NUMBER

2827

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/644,476

Applicant(s)

CORISIS ET AL.

Examiner

David E Graybill

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34 is/are allowed.
- 6) ☒ Claim(s) 1-33 and 35-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Claims 40-60 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-28 and 39 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The non-described subject matter is the claims 1, 11, 13, 14, 21, 38 and 39 dielectric materials having the particular claimed dielectric constants. Specifically, the composition of the materials is not identified.

Claims 1-28 and 39 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The non-described

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subject matter is the claims 1, 11, 13, 14, 21, 38 and 39 dielectric materials having the particular claimed dielectric constants. Specifically, the composition of the materials is not identified.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-28, 38 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1, 11, 13, 14, 21, 38 and 39, the dielectric constants are improperly recited without scientific units.

Claim 12 contains the trademark "TEFLON." Where a trademark is used in a claim as a limitation to identify a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See Ex parte Simpson, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark cannot be used properly to identify any particular material or product. A trademark is used to identify a source of goods, and not the goods themselves. Thus, a trademark does not identify the goods

associated with the trademark. In the present case, the trademark is used to identify the dielectric material; accordingly, the identification is indefinite.

In claim 15, the scope of the limitation, "selecting the dielectric material to include a gas" is unclear because it is unclear if the limitation, "to include a gas" is merely an intended use limitation, or if the dielectric material includes a gas. Further, if the limitation is an intended use limitation, the property of the material that renders it selectable is not recited and cannot otherwise be determined.

In claim 16, the scope of the limitation, "selecting the dielectric material to include gas, argon and/or helium" is unclear because it is unclear if the limitation, "to include gas, argon and/or helium" is merely an intended use limitation, or if the dielectric material includes a gas, argon and/or helium. Further, if the limitation is an intended use limitation, the property of the material that renders it selectable is not recited and cannot otherwise be determined.

In claim 16, the term "gas" is redundant with the term "argon and/or helium" and does not further limit the scope of the claim.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6-10, 13, 17-26, 28-33, 35 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Conru (5086018).

At column 2, line 46 to column 4, line 9, Conru teaches the following:

1. A method for packaging a microelectronic substrate, comprising: positioning a conductive member 10 at least proximate to the microelectronic substrate 12, the conductive member having first and second neighboring conductive portions 14 with at least part of the first conductive portion separated from the neighboring second conductive portion to define an intermediate region between the conductive portions; electrically coupling 16 the first conductive portion of the conductive member to a first coupling site 15 of the microelectronic substrate and electrically coupling 16 the second conductive portion of the conductive member to a second coupling site 15 of the microelectronic substrate; and providing a dielectric material 17 in the intermediate region between the

conductive portions, the dielectric material having a dielectric constant less than about 3.5.

2. The method of 1 wherein the conductive portions each have a first surface adjacent to the microelectronic substrate, a second surface facing opposite the first surface, and a third surface between the first and second surfaces, and wherein the method further comprises providing the dielectric material adjacent to the third surfaces of the conductive portions.

3. The method of 1 wherein the conductive portions each have a first surface adjacent to the microelectronic substrate, a second surface facing opposite the first surface, and a third surface between the first and second surfaces, and wherein the method further comprises disposing the dielectric material on the second surfaces of the conductive portions and applying a force normal to the second surface to displace at least some of the dielectric material into the intermediate region between the conductive portions adjacent to the third surfaces of the conductive portions.

4. The method of 1 wherein positioning the conductive member includes positioning a leadframe adjacent to the microelectronic substrate, and wherein the method further comprises providing the dielectric material between neighboring leadfingers of the leadframe.

6. The method of 1, further comprising adhering a layer of the dielectric material to the conductive member.

7. The method of 1, further comprising: disposing the dielectric material on the conductive member; and applying heat and/or pressure to the dielectric material after disposing the dielectric material on the conductive member.

8. The method of 1, further comprising disposing the dielectric material on the conductive member in a liquid ["melted"] or vapor phase.

9. The method of 1 wherein electrically coupling the conductive portions of the conductive member to coupling sites of the microelectronic substrate includes attaching wire bonds between the conductive portions of the conductive member and bond pads of the microelectronic substrate.

10. The method of 1, further comprising disposing an encapsulating material 17 over at least part of the conductive member and the microelectronic substrate.

13. A method for processing a circuit board for coupling to a microelectronic substrate, comprising: providing a circuit board 10 having a first conductive trace 14 with a portion spaced apart from a corresponding portion of a second conductive trace 14 to define an intermediate region between the first and second conductive traces; and disposing in the intermediate region

between the conductive traces a dielectric material having a dielectric constant less than approximately 3.5.

17. The method of 13 wherein the conductive traces each have a first surface, a second surface facing opposite the first surface, and a third surface between the first and second surfaces with the third surface of the first conductive trace facing the third surface of the second conductive trace, and wherein the method further comprises disposing the dielectric material on the second surfaces of the conductive traces and applying a force normal to the second surfaces to displace at least some of the dielectric material into the intermediate region between the conductive traces adjacent to the third surfaces of the conductive traces.

18. The method of 13 wherein disposing the dielectric material includes adhering a layer of the dielectric material to the conductive member.

19. The method of 13, further comprising applying heat and/or pressure to the dielectric material after disposing the dielectric material on the conductive traces.

20. The method of 14 wherein disposing the dielectric material includes disposing the dielectric material in liquid or vapor phase.

21. A method for processing a leadframe for coupling to microelectronic substrates, comprising:

providing a leadframe having first and second connected leadfingers, at least a portion of the first leadfinger being separated from a neighboring portion of the second leadfinger, each leadfinger having a first surface, a second surface opposite the first surface, and a third surface between the first and second surfaces, the second surface having a bond site for receiving wire bonds; and

applying to the leadframe a dielectric material having a dielectric constant of less than about 3.5, the dielectric material being positioned adjacent to the third surfaces of the leadfingers and/or proximate to the third surfaces to extend between the third surfaces of the first and second leadfingers when the leadframe is connected to a microelectronic substrate.

22. The method of 21 wherein disposing the dielectric material includes disposing a pliable dielectric material on at least one of the first and second surfaces adjacent to the third surface.

23. The method of 21 wherein disposing the dielectric material includes disposing a first dielectric material 11 on one of the surfaces of the leadfingers, further comprising disposing a second dielectric material 17 different than the first dielectric material on another surface of the leadfingers.

24. The method of 21 wherein disposing the dielectric material includes disposing a pliable dielectric material on at least one of the first and second surfaces adjacent to the third surface, and wherein the method further comprises applying a normal force to the at least one of the first and second surfaces to displace a portion of the dielectric material to a point between the third surfaces of the first and second leadfingers.

25. The method of 21, further comprising: attaching a wire bond to the first leadfinger before disposing the dielectric material; and disposing the dielectric material on the wire bond.

26. The method of 21, further comprising completely filling in a region between the third surface of the first leadfinger and the third surface of the neighboring second leadfinger.

28. The method of 21 wherein disposing the dielectric material includes disposing the dielectric material in liquid or vapor phase.

29. A method for packaging a microelectronic substrate, comprising: positioning leadfingers of a leadframe adjacent to corresponding bond sites 15 of the microelectronic substrate; electrically coupling the leadfingers to the bond sites; disposing a first dielectric material adjacent to first surfaces

of the leadfingers and the microelectronic substrate; disposing a second dielectric material adjacent to second surfaces of the leadfingers facing opposite the first surfaces; and introducing at least some of the first and/or second dielectric material into a gap between adjacent leadfingers by biasing the leadframe toward the microelectronic substrate and/or applying heat to at least one of the dielectric materials.

30. The method of 29 wherein biasing the leadframe includes applying a normal force to the at least one of the first and second surfaces of the leadfingers.

31. The method of 29 wherein disposing the first dielectric material includes adhering a layer of the first dielectric material adjacent to the first surfaces of the leadfingers.

32. The method of 29 wherein disposing the first dielectric material includes applying a layer of adhesive to the first dielectric material and adhering the adhesive layer to the microelectronic substrate.

33. The method of 29 wherein disposing the first dielectric material includes depositing particles of the first dielectric material to form a layer of the first dielectric material.

35. The method of 29, further comprising: leaving portions of the second surfaces of the leadfingers uncovered by the second dielectric material; and attaching wire bonds between the bond

sites of the microelectronic substrate and the uncovered portions of the leadfingers.

38. The method of 29, further comprising selecting at least one of the first and second the dielectric materials to have a dielectric constant less than about 3.5.

To further clarify the teaching of a dielectric material having a dielectric constant less than about 3.5, Conru teaches that the material is Pyralux, and the dielectric constant of Pyralux is less than about 3.5.

To further clarify the teaching of providing a circuit board 10, the leadframe is a circuit board.

To further clarify the teaching wherein disposing the first dielectric material includes depositing particles of the first dielectric material, particles are minute quantities, and it is inherent that minute quantities of the material are deposited.

To further clarify the teaching of leaving portions of the second surfaces of the leadfingers uncovered by the second dielectric material; and attaching wire bonds between the bond sites of the microelectronic substrate and the uncovered portions of the leadfingers, Conru teaches leaving portions of the second surfaces of the leadfingers uncovered by the second dielectric material; and attaching wire bonds between the bond

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sites of the microelectronic substrate and the uncovered portions of the leadfingers, before the leadfingers are covered.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conru (5086018).

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Conru is applied to the rejection for the same reasons it was applied to claim 1.

Conru does not appear to explicitly teach the following:

15. The method of 13, further comprising selecting the dielectric material to include a gas.

16. The method of 13, further comprising selecting the dielectric material to include gas, argon and/or helium.

Regardless, as evidenced by Yoneda (5569625) at column 2, lines 20-34, it is inherent in the process of Conru of disposing the dielectric material that the dielectric material is selected to include gas.

Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Conru as applied to claims 1-4, 6-10, 13, 17-26, 28-33, 35 and 38, and further in combination with Doan (6335225).

Conru does not appear to explicitly teach the following:

5. The method of 1 wherein positioning the conductive member includes positioning adjacent to the microelectronic substrate a printed circuit board having conductive traces, and wherein the method further comprises providing the dielectric material between the conductive traces of the printed circuit board.

Nonetheless, at column 1, line 59 to column 2, line 2, Doan teaches wherein positioning a conductive member includes

positioning adjacent to a microelectronic substrate 10 a printed circuit board having conductive traces 16.

Moreover, it would have been obvious to combine the process of Doan with the process of Conru because it would provide a conductive member.

Claim 11, 14, 36, 37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conru as applied to claims 1-4, 6-10, 13, 17-26, 28-33, 35 and 38, or in the alternative, over the combination of Conru (5086018) as applied to claims 1-4, 6-10, 13, 17-26, 28-33, 35 and 38, and Furutani (5932345).

Conru teaches the following:

37. The method of 29, further comprising: disposing an encapsulating material 17 adjacent to the leadframe and the microelectronic substrate; and selecting at least one of the first and second dielectric materials to have a dielectric constant.

However Conru does not appear to explicitly teach selecting at least one of the first and second dielectric materials to have a dielectric constant less than a dielectric constant of the encapsulating material, or the following:

11. The method of 1, further comprising selecting the dielectric constant of the dielectric material to be from about 1.0 to about 2.0.

14. The method of 13, further comprising selecting the dielectric material to have a dielectric constant of from about 1.0 to about 2.0.

36. The method of 29 further comprising selecting the first and second dielectric materials to have approximately the same dielectric constant.

39. The method of 29, further comprising selecting the first dielectric material to have a dielectric constant of from about 1.0 and to about 2.0.

Nevertheless, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose the particular claimed dielectric constant limitations because applicant has not disclosed that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another dielectric constant. Indeed, it has been held that optimization of range limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See MPEP 2144.05(II):

"Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the

prior art unless there is evidence indicating such concentration or temperature is critical. '[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.'" In re Aller, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). See also In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969), Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989), and In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990). As set forth in MPEP 2144.05(III), "Applicant can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range. 'The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.' In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP § 716.02 - § 716.02(g) for a discussion of criticality and unexpected results."

In any case, in the alternative, at column 22, lines 1-34; and column 32, line 9 to column 33, line 36, Furutani teaches

selecting a dielectric die attach adhesive material to have a dielectric constant of from about 1.0 to about 2.0 ["less than 3"].

In addition, it would have been obvious to combine the process of Furutani with the process of Conru because it would provide a dielectric material.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Conru as applied to claim 1, and further in combination with Furutani (5932345).

Conru does not appear to explicitly teach the following:
12. The method of 1, further comprising selecting the dielectric material to include Teflon.

Still, at column 22, lines 4-7, Furutani teaches this limitation.

Furthermore, it would have been obvious to combine the process of Furutani with the process of Conru because it would provide a dielectric material.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Conru as applied to claims 1-4, 6-10, 13, 17-26, 28-33, 35 and 38, and further in combination with Moden (6346152).

Conru does not appear to explicitly teach the following:

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27. The method of 21 wherein disposing the dielectric material includes dipping the leadframe into a volume of the dielectric material.

Notwithstanding, at column 5, lines 29-33; and column 7, lines 42-66, Moden teaches this process.

In addition, it would have been obvious to combine the process of Moden with the process of Conru because it would enable disposing the dielectric material.

Claim 34 is allowed.

The prior art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to the group receptionist whose telephone number is 703-308-1782.

Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is 703/305-3431.



David E. Graybill
Primary Examiner
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